THE MONTHLY REVIEW

PUBLISHED MONTHLY BY

American Electroplaters' Society

545 FIFTH AVENUE, NEW YORK, N. Y.

October 1943 • Vol. XXX, No. 10

Subscription $3.00 a Year

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NATIONAL HEADQUARTERS

545 Fifth Ave., New York, N. Y. • Phone MUrray Hill 2-4631

JACK BAIN, *Publisher*

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Entered as second class matter January 21, 1943, at the post office at New York, N. Y., under the Act of August 24, 1912.

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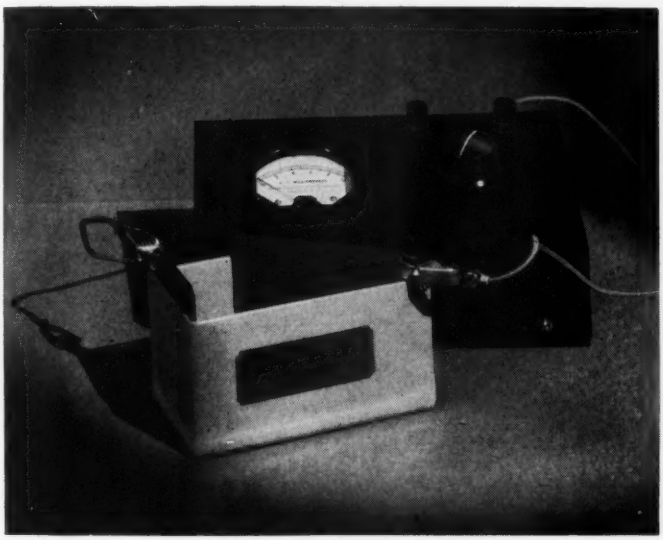

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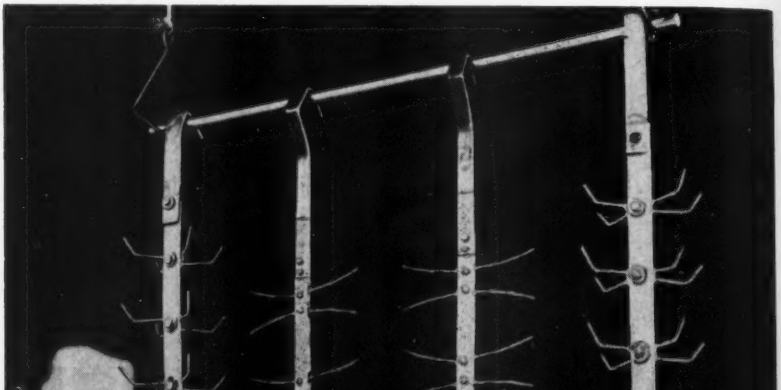

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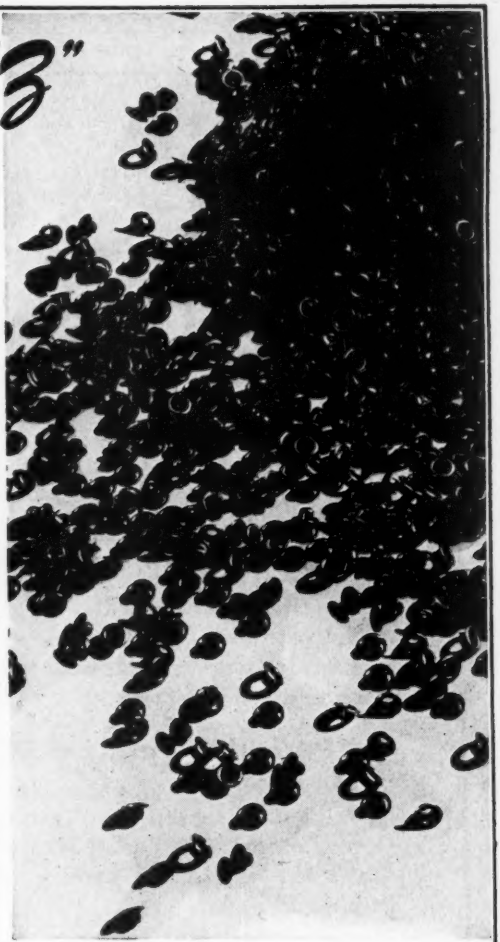

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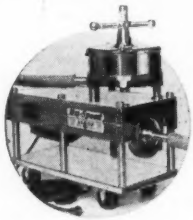

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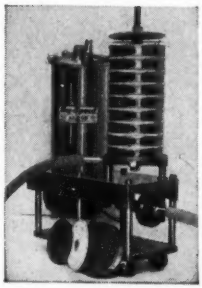

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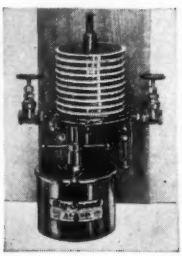

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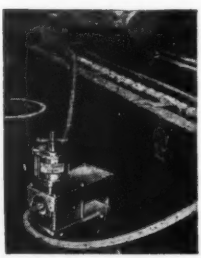

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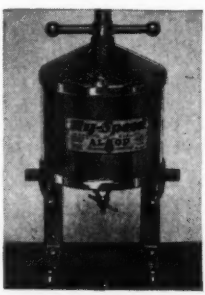

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THE MONTHLY REVIEW

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Glue for Polishiing

By LaV. VERZIER
The Lea Mfg. Co.

THOUSANDS of tons of glue are used annually in the United States for polishing many varied metal products. Much of the glue is used very efficiently as the consumers have spent time and effort in learning to purchase and handle it correctly. However some of it is used inefficiently due to the operator not being familiar with the characteristics of glue and the pitfalls encountered. In addition there is always a certain amount of glue sold which is unsuited for polishing wheel use.

Because the greatest damage can be, and is, caused by using glue incorrectly, this phase will be discussed first. Suggestions as to purchasing will also be included.

A high grade animal hide glue of properly balanced jelly strength, viscosity, melting point, and flexibility; hold the abrasive efficiently, is best for use in polishing. This glue should be free from odor but, more important, should be free from excess bacteria. While odor usually denotes the presence of bacteria some of the most harmful bacteria produce no odor.

Large users and suppliers' laboratories usually test glues for the above, also for moisture, ash, foam, pH, etc. These tests are carefully outlined in any good text on glue, especially Bogue's "The Chemistry and Technology of Gelatin and Glue." Also "Modern Glues and Glue Handling" by Teesdale-Bezeau. If it is impractical for the consumer to test glue it is important to purchase glue from a reliable source specializing in Polishing Glue.

Storage is important and it has been found that glue must be stored in a cool, dry place, away from dripping water or steam pipes, and when kept under such conditions glue will remain in good condition for years. If, however, any of the glue should become wet, this should be removed and dried. This material should be used as soon as possible as such glue will pick up bacteria and will spoil rapidly thereafter.

When the amount needed for the day has been determined, the proper proportions of glue and water should be weighed carefully into batches which will be used in four to five hours. These should be placed in clean sterile pots to soak according to form of glue used. (Ground glue

should soak at least one hour; Flake Glue three to six hours; and Sheet Glue five to ten hours or over night). In general Ground Glue is equal to any other form of glue and allows faster preparation because of faster soaking.

The glue should be soaked in covered containers, in which condition it will not be affected on standing a day or two, although this practice is not generally recommended. Glue in this condition ready to be melted down is superior to cooking all of the glue for seven or eight hours or longer, as it loses life or strength while cooking, in direct proportion to the loss in viscosity or jelly strength. Figure 1 shows the effect of viscosity breakdown for several different concentrations commonly used. Figures 2 and 3 show the effect on viscosity and jelly strengths for a 12½% solution at various temperatures. These graphs will show the importance of maintaining the lowest glue pot temperature for continued heating. They will also show that glue cooked over 10 to 15 hours, even at 140°, will have lost a good portion of its life. Wheels made from such glue show a loss in efficiency proportionate to the loss in glue life.

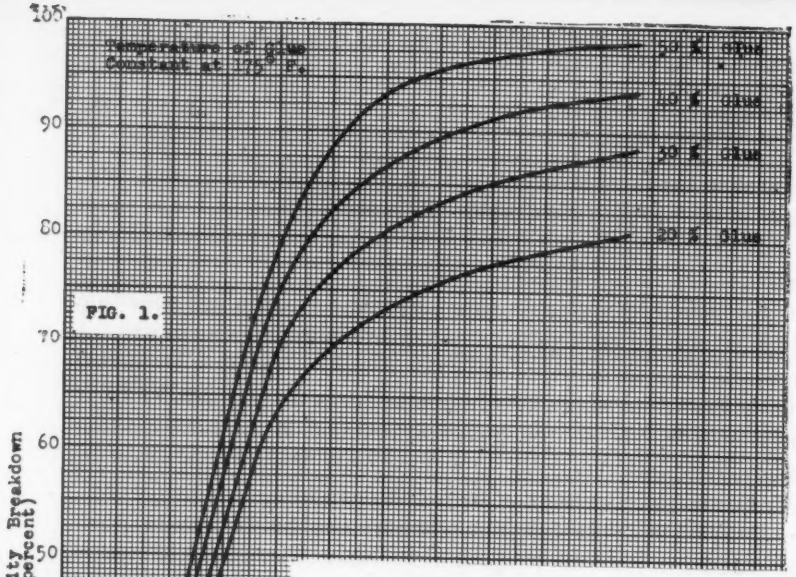
The proper proportions of glue to be mixed for various sizes of abrasives vary with the grades of glue used, which in turn vary with the source, as well as personal preference.

In Table No. 1 the figures used are approximate and can be varied to suit the glue on hand. After the optimum figures are obtained for a particular brand of glue they should be rigidly adhered to.

TABLE No. I

Abrasive Size	% Glue by weight	% Water by weight
30	50	50
36	45	55
46	40	60
60	35	65
80	33	67
100–120	30	70
150–240	25	75

When the soaking is complete place the pot in the water bath or transfer to glue melter. Glue should under no circumstances be melted directly over open flame or other source or high temperature as it will burn. To hasten melting, stir with a sterile stick, spoon, rod or mechanical


Temperature of Glue Constant at 170° F.
FIG. 1.
Viscosity Breakdown (percent)
0
10
20
30
40
50
60
70
80
90
100
0
10
20

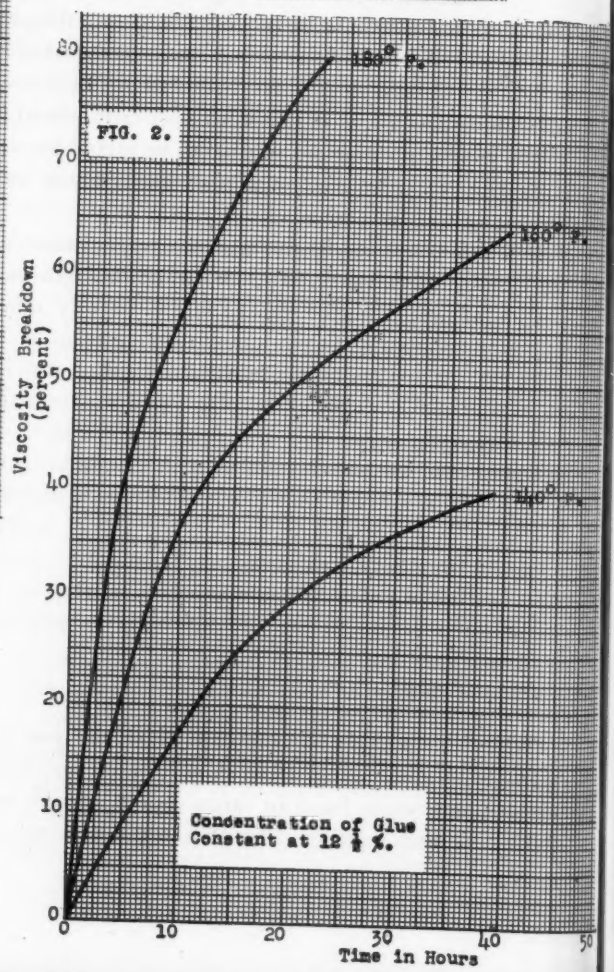


FIG. 2.
Viscosity Breakdown (percent)
180° F.
160° F.
140° F.
Condentration of Glue Constant at 12 ½ %.
0
10
20
30
40
50
60
70
80
0
10
20
30
40
50
Time in Hours

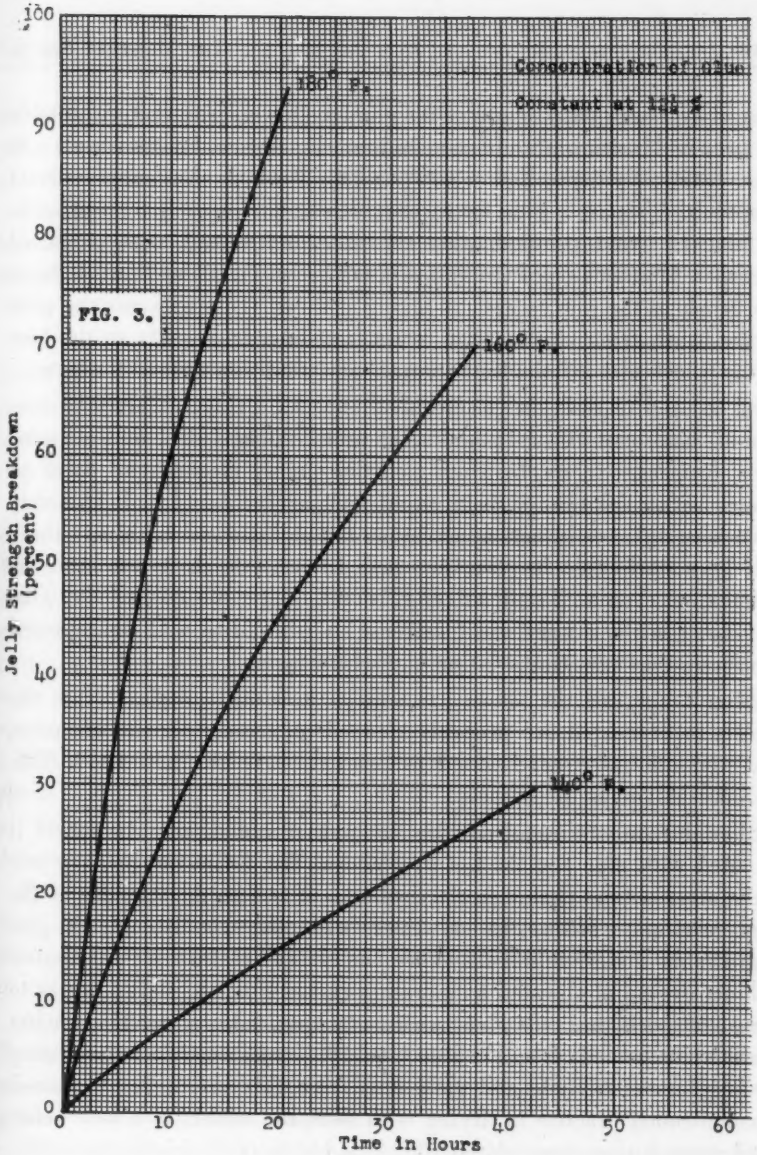


Figure 1. Effect of Heat on Glue Viscosity

Figure 2. Effect of Continued Heat on Glue Viscosity

Figure 3. Effect of Continued Heat on Jelly Strength

stirrer. To retain the strength of the glue, the lowest temperature suitable to proper brushing should be maintained. Automatic glue pots are thermostatically controlled at 140° to 150° F which eliminates constant watching. A separate glue brush should be kept for each concentration of glue to avoid contaminating the glue and wheels with oversized abrasive. Another suggestion that will add greatly to wheel life is to hang the brush in the pot instead of laying it down. This prevents the glue in the brush from chilling and being transferred unevenly to the face of the wheel, also eliminates an unsanitary condition around the pots.

At the end of each day any *cooked out* glue (glue subjected to continuous heat over 10 or 15 hours) should be disposed of and all pots, pans, brushes, stirrers, benches, etc., thoroughly cleaned and dried or treated with a solution of disinfectant such as Hycol or Lysol. This may seem wasteful, costly and unnecessary but if followed faithfully there will be a noticeable increase in wheel life. Although it has been the practice of even well ordered glue rooms to use the cooked out glue for sizing coats, a very great increase in wheel life will be achieved if a fresh, thin new glue solution is used for sizing.

After taking all the above precautions it is still necessary that the wheels to be coated are properly cleaned of grease, oil, old abrasive, etc., and otherwise conditioned to properly take the new head. This includes balancing, facing, etc.

Should sizing be required, this is applied and dried. The wheel is recoated with glue and the head rolled on. The following hour or two is the most critical period in the drying as it is here the strength of the glue develops. Chilling, as in winter, will affect the life of the glue appreciably and should be avoided, as should elevated temperatures. Cabinet drying at elevated temperature can also be carried so far as to completely dehydrate the glue causing cracking, flaking, etc. The amount of water customarily found in glue (10-14%) is necessary for developing the maximum strength, and variations from this will cause weakness. Recommended practice in drying is to store the wheels in a well ventilated room at approximately 80°-85° F and 50%-60% relative humidity. One coat wheels will dry under such conditions in 18 to 24 hours while two coat heads may require 24 to 48 hours. There are patented wheel drying machines using Infra-Red drying lamps which cut drying time to a few hours. Some people advise rotating the wheels on a revolving spindle which also hastens drying.

A properly set up and dried wheel may be broken up with a pipe but

the best procedure is to roll the face slowly against a small diameter roll with enough pressure to produce a fine uniformly cracked head. Such a head will give long and satisfactory life on precise polishing operations.

The use of a glue hydrometer is widely advocated for the replacement of water lost by evaporation. The hydrometer will also check errors in weighing glue but a viscosity test is necessary to determine the condition of the cooked product.

All the above information has been printed at various times and undoubtedly is well known by many readers. However very little explanatory material is given for these recommended procedures. Some of this is discussed briefly with the hope that it may clarify the reason why they must be followed.

Glue depends upon the complexity of its component parts or molecules to produce stickiness and strength, much the same as does rubber. When this complex structure is heated with water it continues to separate into less complex molecules until the resultant melted material no longer exhibits the characteristics of glue. The same break-up can occur by bacterial infection, and as glue is one of the best foods for bacteria, care must be exercised by the manufacturer and the consumer to prevent excess infection.

In the manufacture of hide glue, fresh, salted, dried and tanned hide pieces, ears, snouts, fleshings, etc., are processed. The original condition of the raw material and the care with which it is sorted can make the difference between good and bad glue.

Poor sorting requires excess lime swelling which causes excess hydrolytic decomposition producing low quality glue. Although any glue plant may seem dirty, everything is sterilized and checked for bacteria in various stages of manufacture.

After swelling is complete (12 to 14 weeks), the lime is washed out, the swollen stock neutralized. The acid used in neutralization of the glue affects the product, and this may be another cause of differences in glue grades from competitive companies.

The neutralized stock is now put into suitable cookers and extraction of the glue begins. As each company has a different cooking schedule, the first cook, or run, differs for each. This also holds true for each successive run in which the time and temperature are increased to extract the maximum amount of glue from the stock. From this it will be seen that labelling glue "First run" so as to obtain a better price, means nothing. It would theoretically be possible to run one cook and

extract practically all of the glue calling the resulting material "First run." Such glue would be valueless for polishing.

In the past few years many of the glue companies produced super-strength glues by making the first separation at a very low temperature and a very short cook. These glues are too high in quality for polishing as they jell too rapidly and are subject to cracking, also otherwise difficult to apply properly. Each run of stock is next piped to evaporators to concentrate the liquor until it will jell properly. Special blends of glue can be made at this time, otherwise flake or ground glue can be batch blended in the dry condition. The concentrate is now drawn off and allowed to jell.

The jellied glue is dried on chill belts or rolls and flaking machines, or on screens in drying tunnels.

The dried glue is now sampled and tested for grade. Reference samples are taken and retained by the manufacturer in the event question is raised by the users. Okayed material is then bagged, barrelled, labelled and stored to await shipment. It is from here that the proper grade is sold to consumer or supplier.

Glue is graded according to several systems which are mainly as follows:

1. Trade name glue for specific use such as "Special Polishing Wheel Glue," "Hercules Glue," etc. This method has its good points and its faults.

   Reliable glue sources must maintain the proper type, grade, and uniformity.

   The consumer has little information to go on and must have faith in the integrity of the supplier.

2. Comparison of grades by Peter Cooper Standards using letters or numbers:

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   No. 1 Extra 1⅝
   1X* 1¾
   1¼ 1⅞
   1⅜ 2

   * = 1 cross

   These Cooper standards are available and are used by consumers as well as suppliers for comparison tests. These designations will definitely place the glue in its proper relationship to other glues.

3. Comparison of the viscosity and jelly strength when tested under

standard conditions on the Glue Association standard test equipment. Any glue can be tested by this method by a glue manufacturer even if the grade is unknown, and the designation in grams jelly strength, and viscosity in millipoise can be duplicated. This does not prove that glue of same designations have to be identical in life or usefulness.

The choice of method of designation depends on the supplier who uses the method or methods most suited to himself or to the consumer. Small consumers are not likely to test the glue so they buy using Method No. 1 Large consumers may test using the purchased Peter Cooper Standards for comparison. The third method is applicable to sales made by glue manufacturers as they alone can now obtain the standard testing equipment. Tests by this method will have to be made on samples sent to the glue manufacturers.

In the Purchasing Department much discretion and diplomacy must be exercised. Many large consumers buy direct from manufacturers but smaller users generally buy from supply houses. Should the glue room complain about the glue a sample returned to the supplier will be checked; and if they report the glue to be of the proper grade for polishing the glue department should then check equipment and technique for using it. The supplier will usually cooperate in surveying such conditions and will make helpful suggestions. This procedure is not suggested to disparage anyone as glue can and does go wrong and the suppliers are always desirous of knowing when this occurs.

It is advisable never to change a glue source with the belief that glue is glue, or because of prices. A Glue room may have spent months or years finding a suitable type glue and "bargain glue" can be as represented and yet not give satisfactory results. In general, glue purchasing should be conducted along the lines of common sense which would include the following:

1. Know the grade required and do not accept inferior grade or quality at any price.
2. Choose only a supplier of highest integrity, one known to specialize in glue for polishing use.
3. Know that the glue department is set up properly and functioning efficiently.
4. Investigate all complaints thoroughly so as to determine the cause. Let the supplier test and evaluate his product.
5. Until exhaustive tests prove the superiority of other materials make no complete change or even contemplate one.

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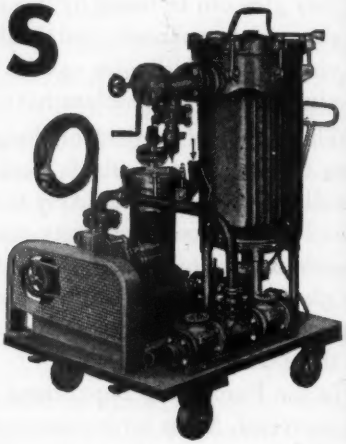

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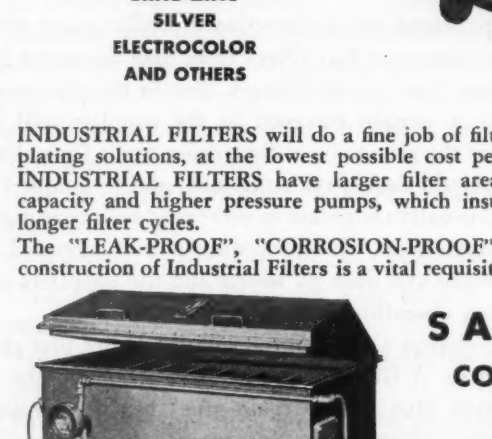

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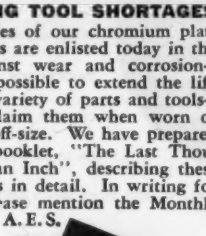

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Paper Awards

By WALTER L. PINNER

BY action of the Executive Committee the following permanent rules governing the Paper Awards Committee are to be included as an attachment to the constitution and by-laws of the society.

I. The Committee on Paper Awards shall consist of not less than three nor more than five members and shall be separate and distinct from the Committee on Exhibit Awards. No two members of the committee shall be members of any one Branch. The Chairman of the committee shall be appointed by the President of the Supreme Society within 60 days from the adjournment of the National Convention. The other members of the committee are to be appointed by the President from a panel submitted by the Chairman. This panel shall contain the names of twice the number of members to be appointed.

II. The following paper awards are to be made:

A. The Herminie Dorothea Proctor Award of $100.00 is to be made to any person for the best paper presented during a contest year at the Annual Convention. This award is given by Charles H. Proctor, Founder of the Society in memory of the late Mrs. Proctor.

B. The Founder's Gold Medal is to be given as the prize for the best paper presented during a contest year at the Annual Convention by a member of the Society. However, if the winner of award A is an active or associate member, award B will go to the member who is next in line for award A.

C. An award of $50.00 is to be given for the best paper printed during a contest year in the Monthly Review. The author may be any person, not necessarily a member of the Society.

D. The A.E.S. Gold Medal is to be given to a member for the best paper printed during a contest year in the Monthly Bulletin. However, if the winner of award C is an active or associate member, award D will go to the member who is next in line for award C.

E. The Samuel Heunerfauth Cup is to be given for the best paper

presented by a Branch and pubished during the contest year in the MONTHLY REVIEW or presented during the contest year at the Annual Convention. To be considered a Branch paper, at least five members of the Branch shall have participated in the preparation of the paper and the librarians of the several Branches shall advise the Chairman of the Paper Awards Committee of those papers which are to be considered as Branch papers and therefore eligibe for this award.

III. General Consideration for Award.

A. The "contest year" shall be from the close of one annual convention to the close of the convention in the year for which the award is made. Papers presented at a Branch in one contest year, but printed in the REVIEW of the following year, shall be classified in the year in which they are printed in the REVIEW.

B. It is preferable, but not mandatory, that papers to be considered shall be:

(1) Preprinted 30 days in advance of the Annual Convention, or,

(2) Submitted to the Committee in triplicate 30 days in advance of the Annual Convention.

C. In judging a paper for an award, there should be complete disregard of the author's affiliation, e.g., whether he be the Research Associate, or an employee of a company which may benefit from the publication, etc.

D. Papers which have received prior presentation, before other Societies, or prior publication outside the publications of the A.E.S., shall be considered ineligible for competition. This shall include a re-write of such papers, unless the re-write shall contain new material in which case the new material shall be eligible for consideration.

IV. Specific Considerations for Award.

A. Immediate value to the electroplating Industry.....30
This shall be measured by such considerations as:

(1) Its money-saving worth in pointing out economies in existing processes.

(2) Improvement on existing processes.

(3) Simplification of control of process or of measurement of quality of product.

(4) Novel theoretical considerations leading to a more complete understanding of processes.

(5) New processes for an existing product.

(6) New products.

B. Scientific value 20

This classification is intended to reward papers having a long-time future value, although they might be of small immediate practical value. A paper may receive a high rating under both A and B.

C. Originality of subject matter, or value as a review paper.....20

A paper which is purely a review paper would be rated as such on the basis of whether the review was of sufficient scope and was so presented as to be of considerable value to a large number of members.

D. Clarity of presentation 30

The principal emphasis should be on presentation of subject matter in a clear understandable manner. Extensive plots, photomicrographs, etc., do not necessarily add to clarity of presentation. The length of the manuscript shall be considered immaterial.

V. Announcement of paper awards shall be made during the last business session of the Annual Convention, and winners of awards shall be requested in advance to be present.

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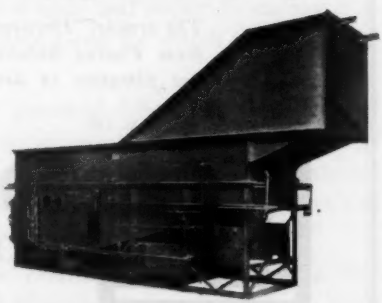

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British Platers Look Ahead

By ROBIN WALKER

THE plating and metal finishing industries in Britain are, while up to their eyes and over in war work, not losing sight of the post war position, and are making in fact many moves now to meet the conditions which they anticipate post war.

It is agreed and admitted, of course, that the position is not one which can be accurately forecast and that many factors may intervene to throw the judgments of even the most expert trade authorities out of focus. Taking that risk into consideration, the big firms, mainly located in the Manchester and Sheffield area, are planning ahead along the following lines, described briefly by Mr. E. H. Lever, chairman of the well known tinplate and finishing firm of Richard Thomas and Co., Ltd., discussing the position in London this week.

His firm was attempting, he told me, to solve along with the leaders in the industry, the two main problems which affect all in the tinplate trade (and here it could be mentioned that the position is materially the same in other plating and finishing industries). These twin problems were Redundancy and Reconstruction. There were a few members of the British industry who were not now convinced that it was essential to turn over production of a substantial amount of the plant power to the modern methods of manufacture and it was his hope and policy to endeavor to find a means of achieving a cooperative basis by which this could be reached.

He admitted that there were many practical difficulties and that progress had been slow, but that they were devoting much time and energy to the achievement of a unified industry operating on the most modern methods. They were keeping their own plant absolutely up to date and were losing no opportunity of improving it.

They were planning to install at the earliest possible moment an electrolytic tinning unit in their Ebb Vale Plant in conformity with the latest developments in the United States industry, and were doing this in the hope that the experimental work would give them practical experience of the latest methods of tin plating and that this development would

ultimately lead to a wider extension of modern methods of plating and be of advantage in the sale of their own goods, and to the plating industry and the community as well.

He also indicated that in the past, his company had not spent the amount of money on research work which the importance of that factor in an industry such as theirs would demand, and it was their intention to spend more in the very near future on a considerably extended program of plating research work.

Dealing with the financial background of the plating industry in Britain, Mr. Lever pointed out that while profits have remained satisfactory, there was an obvious limit to the extent of profits. An adverse development on the industry could cause a fall in profits but no upward trend of profits could or should be expected.

Control of profits and prices remains so strong in Britain and the Excess Profits Tax which stands at 100 per cent on all plated goods in certain categories, makes a ceiling for profits which cannot be avoided.

The continuation of control would be a factor which would limit profits in the British industry for some time, but taking the long term view, there would be a necessity to pass on to consumers some of the benefits of the efficiency and economy which was being achieved in production. In his opinion the best interests of a plating company was indisputably linked with the interests of its consumers and its staff, and no firm which avoided its responsibilities to the three groups has a right to survive; if it ignored a proper interest in the fact that all three groups were concerned in its affairs, it was ignoring the best interests of its shareholders whose ultimate benefit resulted of course from such an intelligent policy.

He hoped that a 10 per cent dividend could be maintained in view of the outlook in the industry and indicated that as a gesture of their confidence that this could be upheld, were making their own dividend at that basis.

Such a trade summary coming from an admitted expert shows very clearly how the plating and finishing industries in Britain are looking to their future. Their policies, condensed, might be given as follows:

It is hoped that a unified policy for the entire industry or for the separate and distinct sections such as the tinplate industry, will be achieved by some form of agreed control of activity.

Redundancy of plant would be one point which would be dealt with

by such a unified control, the surplus plants being either closed or reconstructed.

Remodeling and refitting of plants on the most modern lines to allow maximum efficiency and output at minimum cost with a bias towards the methods now in use in American plants which will, it is stated, be adopted here.

Research will be hotted up so that the industry here will not be so dependent as it has in the past on chance development or on foreign inventions. This is indeed a general policy in Britain where it is being openly admitted that our industries have outgrown their early superior stage and that new and deliberate research is an essential to continued leadership in this or any industry.

Financially Britains' plating firms will not make much money for some years to come since they anticipate a long period post war of Government control of buying and spending. This will inevitably withdraw from the industry its powers to make increasing dividends possible, but it will similarly discourage competition and encourage unification and cooperation in the industries concerned, which must in the end result in greater efficiency and greater productive and selling power of the British industry.

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By M. R. CALDWELL

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INDUSTRIAL FINISHES

Brass Plating for Rubber Adhesion

By LARRY GRIFFIN

THERE are various theories advanced to explain the necessity of plating different metals with an alloy of copper and zinc to obtain adhesion of rubber on these metals.

One theory that is plausible is the explanation that rubber and the electrodeposited alloy of copper and zinc, when brought together at the high molding pressures and temperatures, enter into a chemical reaction which gives both the rubber and electrodeposited brass alloy a great force of attraction and affinity for each other. This affinity results in a bondage that is enduring under subsequent high, low temperatures and resists high strain and stress.

One reason other metals or alloys are not used is that they are more chemically inactive with rubber, and will not participate in a chemical combination or reaction with rubber, and little or no adhesion is obtainable.

The solution which gave the most satisfactory results is one recommended by Dr. Coates,* in his articles on this subject, and operated as closely as possible to his given conditions.

*H. P. Coates (Proceedings 24th annual convention of American Electroplaters' Society, page 198-217, year 1936).

The solution was of the following composition:

Copper Cyanide	4.1 oz. gal.
Zinc Cyanide	1.8 oz. gal.
Sodium Carbonate	2. oz. gal.
Free Cyanide about	3. oz. gal.

It was found that a P.H. of 10.5 to 11.0 was most satisfactory. The current density recommended is 2 to 5 amps./sq. ft., and the anodes should be preferably 70% copper and 30% zinc, and this solution must be carefully controlled, since the copper and the zinc must be deposited in the ratio of 72% copper and 28% zinc. The maximum copper range being 76% and the minimum 69%. The concentration of the metal salts must be maintained to give this metal ratio.

It is essential to correctly clean and rinse all parts prior to plating. Rinsing must be carried out to the extreme, so there is no trace of Alkaline or acid film on the work before plating. Also, the bath itself must

be kept clean, no oil or insoluble materials should be allowed to accumulate on the surface of the bath. Poor adhesion can often be traced back to even the slightest presence of acid, alkaline, or oil films.

Another indirect cause of bad adhesion may be due to allowing the work to remain in the air for too long a time after plating.

This causes the brass to oxidize and form a film between the brass and rubber. Hence the work should be covered or wrapped as soon as possible after plating. It is important to remember that the sulphur content of the rubber itself, must be low, as high sulphur stocks do not generally give good permanent adhesion.

Before sampling for analysis, the volume of the solution in the tank must be brought up to the proper level and a sample of the solution so taken as to be indicative of the entire solution. This may be done by slowly immersing a glass sampling tube into the solution and then withdrawing, by placing the finger over the top of the tube. The solution may be placed in a sample bottle.

This analysis may be done as given in "The Tenth Edition of Plating and Finishing Guidebook – 1941, page 100," or as described by Dr. Blum and Mr. George Hogaboom in their book, "The Principles of Electro-Plating and Electro-Forming, page 387."

It is necessary when making an addition of copper and zinc cyanide to the bath, to dissolve 1.1 lbs. of Sodium Cyanide for each lb., of Zinc Cyanide. This allows for the formation of the double metallic cyanide compounds, without disturbing the free cyanide content of the bath.

It is preferable when an addition to the bath has been made to cease operation for a short time. The reason for this is that regardless of how well the salts have been dissolved, the bath will give brown and streaky deposits. However, by raising the temperature to 110° or 120° F., for a short period of time this can often be corrected.

If the deposit is coppery, ammonium hydroxide may be added to the bath to brighten and give the deposit a more lemon color. While ammonium hydroxide gives the bath this color, it also raises the P.H. and an excess should be avoided. However its use when controlled properly, tends to improve the plate, and seems to improve adhesion. High P.H. to a certain extent reduces the deposition of copper and may be corrected by addition of Sodium Bicarbonate, or if good ventilation is available, the careful addition of sulphuric acid. Too high P.H. also results in brittle deposits.

It is significant that the percent of each constituent in the deposits may

be varied by raising and lowering the temperature. The percent of copper depositing being the variable factor.

If the bath does not give the maximum current efficiency, a slight increase in sodium cyanide content, or raising the temperature will tend to improve this condition. Often this may be due to the anodes being coated with a passive film which prohibits the solution of the anodes and prevents the passage of the proper current. Cleaning the anodes off or dipping them in $H_2SO_4 + HNO_3$ acids, will give immediate correction. This should be done daily, and the anodes removed when not in use. Often a bath will contain an excess of free cyanide, causing a depletion of the zinc, formation of carbonates, loss in current efficiency with resultant dark and dull deposits and poor adhesion of rubber.

This may be overcome by taking out 1/10 of the volume and putting it aside for use as a stock solution. Water should then be added to the bath to bring it back up to the proper level. The temperature is raised to bring back the copper, and ammonium hydroxide if added in small amounts, will lighten the deposit. Work, at this particular time should be plated at the lowest current density possible.

Some visual control can be exerted as follows, if the anodes turn black while plating, this indicates an insufficient amount of free cyanide in the bath, if the anodes turn black when not in use, a smaller addition of sodium cyanide is needed. The control of the excess cyanide present in the bath, is definitely very important.

It should be noted that low temperature and high current density favor the deposition of zinc. High temperature and low current density favors the deposition of copper. This is borne out when plating deeply recessed parts. The deposit on the low current density areas are red and high in copper. (Use of an inside anode, or higher current density, if possible, will help.) This is also noticeable in barrel plating; if the barrel is so overloaded as to prevent correct movement of the work, the inside or intermost parts receive a redish or coppery deposit.

In concluding this article, it must be stated that the Brass solution, when used as a means to obtain rubber adhesion, should be handled very carefully. If all the conditions that arise are taken care of, as described in the preceeding paragraphs, trouble should be held down to the minimum. Poor adhesion often results from contamination of the solution, presence of films as described in preceeding paragraphs or improper rubber stock. Arsenic should not be used in a solution used for this type of plating.

If the plater carefully follows these recommendations, he should have little trouble in operating the correct bath required for rubber adhesion. In summary, then, the following factors must be controlled.

1. Temperature
2. Current Density
3. Free Cyanide Content
4. P.H.
5. Ammonium Content

By use of the platinum cathode test, one can obtain a good sample for the determination of the percent of copper and zinc being deposited.

MEETING OF ELECTROCHEMICAL SOCIETY, OCTOBER 13-16, 1943

At the Fall Meeting of the Electrochemical Society to be held at the Hotel Commodore in New York City, October 13, 14, 15, and 16, several papers of interest to the metal industries will be presented. The electrotinning of strip steel has focused attention upon continuous plating practices and a symposium on this subject has been arranged. The following papers have been definitely scheduled for this symposium:

Electrogalvanizing of Strip Steel by E. H. Lyons, Jr.
Electrolytic Tin Plate from the Can Maker's Point of View by K. W. Brighton
Tin Plating from the Potassium Stannate Bath by F. A. Lowenheim

In addition papers on the historical development of electrolytic tinning, electrical apparatus used in electrotinning lines, and nickel plating of fine wire are at present in the hands of the Publication Committee of the Society and will in all probability be included.

Further papers relating to electroplating are the following:

Corrosion Resistance of Silver Plated Steel by P. J. Lo Presti
Iron Plating by W. B. Stoddard
Novelties in Electroplating by O. P. Watts
Electrodeposition of Cobalt-Tungsten Alloys from an Acid Plating Bath by M. L. Holt, R. E. Black and P. F. Hoglund
Study of the Deposition Potentials and Microstructures of Electrodeposited Nickel-Zinc Alloys by B. Lustman

The Development of the Crucible Steel Electrolytic Tin Plate Process by E. W. Hopper

Continuous Plating of Fine Steel Wire with Nickel by J. H. Conolly and R. Rimbach

Corrosion of Tin-Nickel Alloy Coatings on Steel in Canned Foodstuffs by A. R. Copson and W. A. Wesley

A Sulfate-Chloride Solution for Iron Electroplating and Electroforming by R. M. Schaffert and B. W. Gonser

In case the company affiliations of the various authors are of interest, the following list will serve:

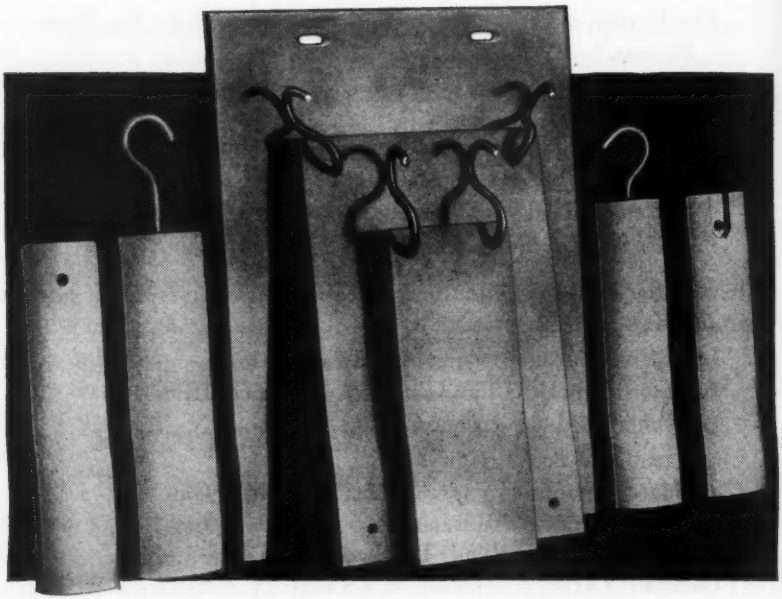
Lyons: The Meaker Company, Chicago, Illinois
Brighton: American Can Company, Maywood, Illinois
Lowenheim: Metal & Thermit Corp., Rahway, N. J.
Lo Presti: Rochester, New York
Stoddard: Champion Paper & Fiber, Hamilton, Ohio
Watts: University of Wisconsin
Holt, Black and Hoglund: University of Wisconsin
Lustman: Carnegie Institute of Technology, Pittsburgh, Pa.
Hopper: Crucible Steel, Midland, Pennsylvania
Copson & Wesley: International Nickel, Bayonne, N. J.
Conolly and Rimbach: Hanover Wire Cloth, Hanover, Pa.
Schaffert and Gonser: Battelle Memorial Institute, Columbus, Ohio

HUGH A. TODD DECEASED

Hugh A. Todd, affectionately known to his associates as Hughie or "No. 7" passed away on July 31, 1943 after an illness which lasted several months, during which he had been living with his son-in-law and daughter, Mr. and Mrs. John J. Knodel, of Rumson, N. J.

Hugh A. Todd was one of the pioneer figures in the Hanson-Van Winkle-Munning Company and in the plating industry of the East. More than 40 years of his life had been spent in the industry, starting with the predecessor companies which now form the Hanson-Van Winkle-Munning Company. For many years past he had been New York State representative for them with headquarters at Syracuse, in which he capably supervised the sales of their products throughout upper New York State.

Hughie leaves a veritable host of friends in the Company, among his customers and throughout the industry. All will miss him. His work is now being carried on under the capable guidance of Robert M. Norton.



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HARSHAW ANODES *and* CHEMICALS

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● You have every reason to sit back with confidence, everytime you specify Harshaw Anodes and Chemicals. Year after year, for more than fifty years, Harshaw field-men have encountered plating problems . . . and solved them. The combined knowledge of these plating specialists supported by constant checking and testing in our laboratory, furnishes you with unequaled "accumulative plating experience".

The Harshaw Anodes and Chemicals which you specify are performance-proved. They have given plating satisfaction through years of peace and war. Harshaw flexibility is evident in our record of speedy adjustment to unusual wartime plating requirements.

Research in plating is still going on in the Harshaw laboratories. You will enjoy the same satisfaction after the war as you do now . . . when you specify "Harshaw Anodes and Chemicals".

Harshaw's Lead Plating booklet furnishes you with practical plating information. Write for it . . . now.

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FOR FAST, EFFICIENT PLATING OF SMALL WAR-IMPLEMENT PARTS

H-VW-M Oblique Barrel Plating Equipment is the choice of prominent war-implement makers for faster plating of small parts. Exclusive design features reduce plating time, assure constant flow of current to work, and decrease the number of rejects.

H-VW-M MERCIL TYPE OBLIQUE PLATING APPARATUS

Capacity: Approximately 2½ gallons of solution and from 3 to 10 lbs. of work per cylinder per load, depending upon nature of work.

Multi-cylinder Units: Available with any desired number of cylinders, all driven directly by a single motor.

Cylinders: Steel, covered inside and out with ⅛" rubber. Cylinders are octagonal, with tapered sides.

Speeds: Normal speed is approximately 6 R.P.M., but simple gear changes permit speeds of 10-12 R.P.M. or 32-34 R.P.M.

Tumbling: Many of our customers have found these units suitable for tumbling operations.

H-VW-M NO. 34 MOTOR DRIVEN OBLIQUE PLATING APPARATUS

Capacity: 25 lbs. of work per load.

Tank: Asphalt-lined wood, unlined steel, or steel lined with 3/16" vulcanized rubber.

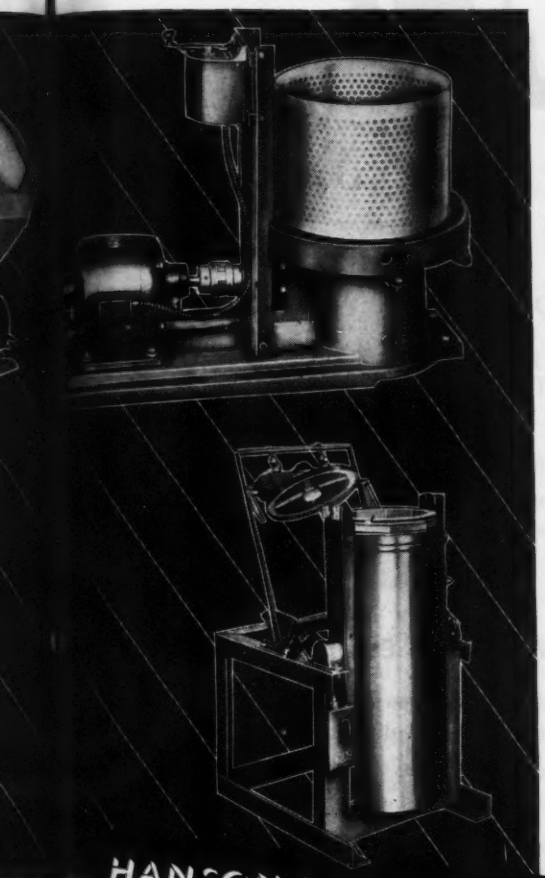
Cylinder: Bakelite with either disc or button contacts or hard rubber with disc contacts only. Cylinder is easily removable for rinsing, loading and unloading.

Drive: Cylinder is directly driven by a 1/6 H.P. motorized worm gear reducer, mounted on the tank and requiring only connection to electric outlet.

Also available from H-VW-M is horizontal type barrel plating equipment in single and multiple cylinder units with bakelite or hard rubber cylinders.

Full Details on all these units will be found in H-VW-M 20-page Bulletin PS-106, yours free for the asking.

TO SAVE TIME AND IMPROVE UNIFORMITY ON WAR WORK



Where small parts are handled on a production basis, H-VW-M Mercil Type Centrifugal Dryers* and Burnishing Barrels* speed work and enable uniform, accurately predetermined results. Both units occupy minimum floor space. Both are ideal for use with plating barrels.

H-VW-M MERCIL TYPE CENTRIFUGAL DRYERS

provide the speediest, most economical method of drying small plated parts. Two sizes are available: No. 1, driven by a ½ H.P. motor, handles baskets up to 12" x 12"; No. 2, driven by a 1 H.P. motor, handles baskets up to 18" x 18". Both sizes can be furnished with forced hot air drying equipment, either electrical or steam. Large bearings and excellent balance virtually eliminate vibration. Conveniently located motor control facilitates starting, stopping, or reversing at will.

H-VW-M MERCIL TYPE BURNISHING BARRELS

are self-contained units, hence unusually simple to install. Barrel, drive gears and motor are all mounted in one movable unit, permitting direct drive and operation at any angle. A unique cover lifting device speeds and simplifies loading. The barrel proper is octagonal, made of welded sheet steel and equipped with hard maple blocks. A steel shield covers barrel, motor and gears, making the unit completely splash-proof. Two sizes are available: No. 1, with inside dimensions 11⅜" x 24" and No. 2, with inside dimensions 14¼" x 30"

H-VW-M Mercil Type Centrifugal Dryers are described in Bulletin CD-101.

H-VW-M Mercil Type Burnishing Barrels are described in Bulletin BB-103.

Either or both Bulletins will be send free on request.

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Manufacturers of a complete line of electroplating and polishing equipment and supplies

PAISLEY PRODS. HAVE NEW BULLETIN

A new bulletin, just off the press, describes the new improved PAISLEY GRIP-TIGHT LABEL PASTE, an adhesive designed for permanently adhering paper labels to all surfaces and materials.

Readers of the MONTHLY REVIEW can obtain copies of the bulletin by addressing their requests to our Chicago address, 1770 Canalport Avenue, Chicago 16, Illinois or New York plant address, 630 W. 51st Street, New York 19, New York.

STEVENS OFFERS NEW PLATING EQUIPMENT CATALOG

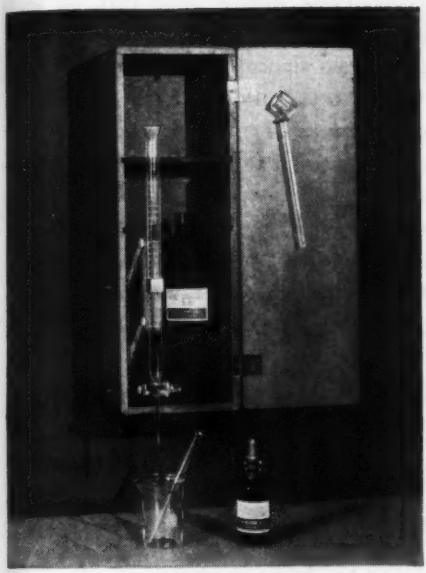
Frederic B. Stevens, Inc. of Detroit, have just published a new catalog illustrating and describing their Full Automatic and Semi-Automatic Plating Equipment.

The catalog is profusely illustrated with reproductions of various model machines – which point out their simpicity of construction – accessibility, absence of overhead construction, and other important details.

A number of the illustrations are of actual installations, showing bright nickle plating, bright dipping of brass parts in bulk, anodizing of aluminum pistons, cleaning and pickling prior to vitreous enameling and numerous other processing operations.

The text matter is clear and concise, having been prepared with marked absence of technical terms, so that the layman can readily see and understand the many outstanding features of their complete line.

KOCOUR ANALYTICAL SETS FOR CLEANING AND PICKLING SOLUTIONS



These sets make it possible to determine the condition of acid pickle or alkaline cleaning solutions. During use acid pickle solutions build up in salts and decrease in effective acidity. As most efficient and economical operation is obtained when optimum acid quantity is present, control is essential. Alkaline cleaners lose effectiveness by being fouled by the material removed from the work and additions of cleaner become necessary to maintain operating efficiency. The use of the sets described here make it possible to control these solutions with a minimum of effort. Readings obtained from the sets are those sought, no involved calculations are required. Complete directions and condition of solution sheets are supplied.

The set, pictured here, consists of a well made cabinet fitted with hardware to hold the necessary glassware during use and storage. The glassware is of the finest make, some of it made especially for us. The solutions are in easily handled bottles, well labeled.

These sets were developed and are manufactured by Kocour Co., 4724 S. Christiana Ave., Chicago, specialists and pioneers in Control Sets for Plating Solutions.

OAKITE OFFERS NEW BOOKLET

Anodic degreasing of steel and copper prior to plating and finishing is now playing a vital role in the production of all types of war matériel. To help Technical Supervisors, Plating Superintendents, Shop Foremen and others handle this work faster and more thoroughly, a new 16-page booklet has just been issued by Oakite Products, Inc., New York, N. Y.

The booklet describes how a newly developed anodic or reverse current cleaning material, Oakite Composition No. 90, quickly and completely removes such tenacious foreign matter as insoluble smut, buffing, polishing, stamping, cutting, drawing compounds, grease, shop dirt, oil and other accumulations from steel and copper surfaces. It is also reported that Oakite Composition No. 90 provides a shallow, dense foam blanket on the surfaces of the solution which stays within definite limits and eliminates dangers of overflowing, fuming and explosion. Another problem solved by this material, the booklet states, is the removal of soil from parts having deep recesses which may not be exposed to good electrocleaning action due to their unusual shape or side.

Included in this manual are informative case histories describing the use of Oakite Composition No. 90 in cleaning aircraft, bomb and radio parts, steel shell magazine, cartridge boxes and many other types of war matériel prior to plating or other finishing operations.

Free copies of this data-filled booklet are available upon request. Write to Oakite Products, Inc., 40 Thames Street, New York 6, N. Y.

PLASTIC BUCKETS HELP ELECTRO PLATERS TO MEET SHORTAGES

The shortage of rubber and ebonite has had a very definite effect on those industries which normally rely upon such materials to give them acid-free transport. In this category one might cite the electroplating industry which requires rubber tubs and buckets for the handling of corrosive acids.

The plastic industry has been thus offered in Britain, the opportunity to step into another sphere of activity and to tackle the work done normally by rubber makers.

In the case of the chemical industry, a plastic bucket is now in very general use and is proving a definite success to such an extent that plastics must continue to share this market even were rubber to be again available. The plastic used is a synthetic made from cast phenolic resin, which has proved not only to be capable of taking the most dangerous acids but of taking them at as high temperatures as 100 degrees C.

ORIFICE-TYPE DUST COLLECTOR

Peters-Dalton, Inc., 630 E. Forest Ave., Detroit, Mich., have developed a small sized orifice-type dust collector having a capacity of 1200 c.f.m.

MEMO
TO: *Producers of War Materials*

URGENT: STOP CORROSION ON ZINC PARTS

√ The Alronox Process

THE ALRONOX PROCESS

Eliminates This Problem

FACTS ABOUT ALRONOX PROCESS

- Non-electrolytic immersion method.
- Produces an even, dense black surface with low reflectivity.
- Low temperature application—212°F.
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- Simple equipment.
- No elaborate controls.
- Adaptable to all zinc and die cast surfaces.
- 200-300 hours salt spray rating on .0002 zinc plate over steel without after coating (no rust).
- Excellent base for organic coatings.
- High weather and humidity resistance.
- Can not chip or peel.
- Low cost.

EXPERIENCED ENGINEERS IMMEDIATELY AVAILABLE FOR CONSULTATION
SAMPLES FINISHED WITHOUT CHARGE

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ALROSE CHEMICAL COMPANY

PROVIDENCE, RHODE ISLAND, U. S. A. TEL. WILLIAMS 3000-3001

This unit is designed especially to meet the requirements of double spindle grinding and buffing lathes. It is however adaptable to many other kinds of work and is reported to be especially effective in work with magnesium.

The cleaning action is caused by the scientifically directed movement of air through an orifice. A compartment at the side collects the sludge and permits its easy removal. A specially constructed diaphram valve controls the water level.

ABRASIVE BELT BACKSTAND

The DBX Abrasive Belt Backstand, stressing front control for adjusting belt tension and tracking alignment, developed by Divine Brothers Company, Utica 1, N. Y., is said to convert practically any type of lathe for abrasive work.

The DBX backstand, a heavy, durable piece of equipment, can be supplied in either right or left hand models. All moving parts are accurately machined to assure alignment, ease of adjustment and a minimum of vibration. The belt can be changed quickly by releasing a friction lock and raising the counterweight arm. The background can be completely enclosed in hoods of sheet steel which are available as well as hoods with built-in platen for flat sanding work.

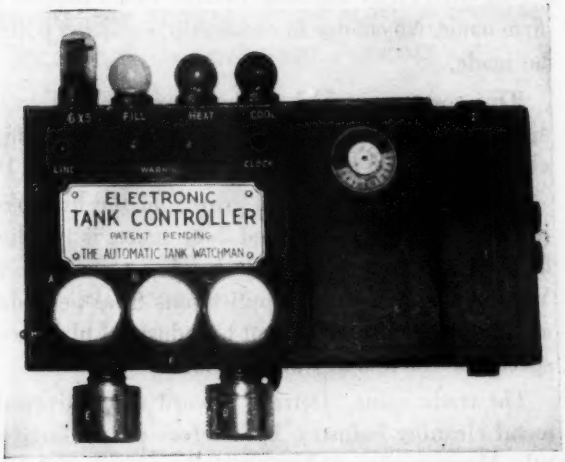
FOREMAN PLATER WANTS POSITION

Foreman plater now employed is interested in making a new connection. Definitely desires to locate in the Connecticut area of Derby, Shelton, Ansonia or Seymour. Applicant has had 45 years experience, written numerous papers and won A.E.S. medals. Willing to make the change at once. Salary requirements reasonable. Those interested in the services of this applicant write *Monthly Review*, Dept. No. M. R. 9.

LEEVER NEW MacDERMID S. M.

Mr. Harold Leever has been appointed Sales Manager for MacDermid, Inc., Waterbury, Conn., replacing Mr. W. D. MacDermid who no longer is associated with the company. Mr. Leever has been with MacDermid a number of years and was formerly western manager.

WHY BUY JUST A TEMPERATURE CONTROL



WHEN THIS ELECTRONIC TANK CONTROLLER

"The Automatic Tank Watchman"

Provides— leveling, leak detection, overflow warning — and temperature control. All of these and many other features are combined in one instrument which can be obtained at no greater cost than what you would pay for a good temperature control alone.

Install one of these controls on your plating tanks and start immediately to save manpower, material and unnecessary waste.

Made in 3 reasonably priced models Write for booklet giving full details

PLATING PROCESSES CORP.

★ HOLYOKE • MASSACHUSETTS

DETREX CORPORATION IS NEW NAME OF DETROIT REX PRODUCTS CO.

Robert A. Emmett, President and Chairman of the Board of Detroit Rex Products Company, metal cleaning engineers, states that DETREX CORPORATION replaces Detroit Rex Products Company as the new firm name. No change in ownership, company policy or management will be made.

This company, which manufactures degreasers, alkali and petroleum spirits washers and emulsion cleaners, degreasing solvents and alkali cleaning compounds was established in January, 1920.

The phenomenally rapid growth of the firm, now over seventy times its original size in combined floor space, is the direct result of years of development and research by chemists, technicians and service engineers. Various metal cleaning applications have been designed and installed, and are especially important to industrial plants concentrating today on speedy production of war materials.

The trade name "Detrex" a word now universally recognized in the metal cleaning industry, is therefore particularly significant in the new title. More concise, and more easily pronounced, the new name promises to be of increasing value in the future.

SECRETARIES PLEASE NOTE

Secretaries of several Branches have made special mention at meetings of Glasstone's Book "The Fundamentals of Electrochemistry and Electrodeposition."

As a result, quite a few members placed immediate orders. One Branch sent in 18 in one mail.

Copies are going fast! Almost 66% of the first printing is now sold. Paper restrictions will not permit reprinting for another year.

You can do a service to the membership of your Branch by urging members to place their orders NOW!

PURICO PUR-BLAC

Black Finish for Steel and Iron
One bath, low temperature salts
Let our Technical Department Process
Samples for You

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PURICO ZN BLACK

A hard adherent black for zinc and zinc
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A new compound for the deburring of
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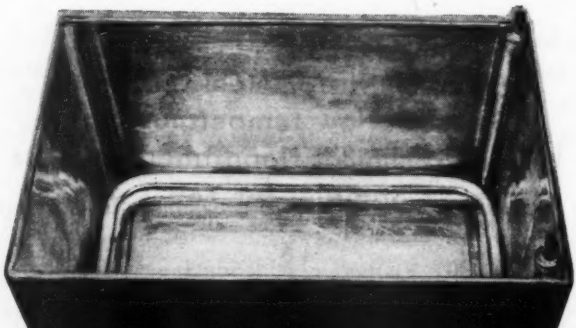

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Take care to specify the best type of lead for each tank lining, to give the longest service. Use the proper thickness to do the job without wasting material. Insist on welding procedures and weldmanship that will guarantee welds to outlast the parent metal.

Storts engineering service will assist you with all design problems. Storts lead lining specialists are expert on every detail of fabrication.

STORTS WELDING COMPANY

42 Stone Street Meriden, Conn.

Manufacturers of Welded Fabrications to Specification

BRANCH NEWS

Business and Social News · Educational Activities

WATERBURY BRANCH

Waterbury Branch held its first meeting of the season September 10, at 8:00 P. M., in the Colonial Room of the Hotel Elton.

In the absence of President Carl Kilborn, Tony Maz, our First Vice President, opened the meeting. It was with regret that he announced the absence of the President. Carl has had to undergo an operation, and will be confined in the hospital for several weeks. Everyone missed him and hopes for his speedy recovery.

Tony also spoke of Dante Cantamessa who, several weeks ago, met with a very serious and unfortunate accident to his eyes. It will be some time before Dante is able to get back to his duties again, and we feel sure that he will appreciate any token of esteem and friendship from the members of the branch.

We were pleased to see among our guests several members from other branches and in particular, Clarence Helmle, Second Vice President of the Supreme Society. When called upon by Tony Maz to say a few words to us, he remarked upon the size of the meeting and congratulated us on the interest that is being shown in these meetings of the Waterbury Branch. He regretted that some of the other branches did not make as good a showing, and hoped that they might profit by our example.

The Supreme Secretary, Elsworth Candee, when called upon, brought to our attention the publication by the Society of the new book, "The Fundamentals of Electro-chemistry and Electrodeposition" written by Samuel Glasstone. This book consists largely of a reprint of articles originally written for the MONTHLY REVIEW with some additions and rearrangements. It is a very compact little book setting forth the principles of electroplating in a simple and understandable manner. Numerous favorable comments have been received, and everyone interested in plating should have it in his library.

Tony called particular attention to the October Meeting. This is a meeting that should not be missed by anyone as George Hogaboom will be our guest speaker, telling of his recent experiences in Washington. Also Lea Manufacturing Company have a movie which they filmed of the 1943 Convention and which will be shown at this time. Surely this program should attract a large number of our members and friends.

Our program this evening began with the showing of three moving pictures: "Submarines at Sea," "H M-Minelayer" and "Sky Fleet of the Navy." As the titles indicate, these pictures gave us intimate glimpses of these branches of the Navy in action.

Earl Couch introduced the speaker of the evening, Mr. Enoch Sprague, pointing out that he is at present Electrical Engineer at the Patent Button Co., but during the last war was connected with the Lake Torpedo Boat Co., and is well versed in the construction and operation of the submarine.

The title of Mr. Sprague's talk was "Submarines, Their Function in Salvage Work," and he told of Mr. Lake's interest in salvage from sunken vessels, fostered by his early observations of a diver's work on the old Hussar, sunk near Hell Gate in New York Harbor. It was reported that the Hussar went down with a large amount of gold, and the diver of Mr. Lake's boy-hood evidently reclaimed some of it. Mr. Lake made friends with this man and in later years attempted to salvage the balance of the cargo by using one of his submarines. After much time and energy spent to locate the wreck, it was finally found beneath the plant of the U. S. Gypsum Co. which had been built out over the old bed of the river, and one could hardly move a four million

dollar plant for a possible million beneath it.

Mr. Lake was the inventor of the even keel type of submarine which in 1904 he attempted to sell to the United States Government, but without success. However, he was able to interest both Russia and Germany and built several submarines for these countries. Later, of course, the United States recognized the value of this type of craft, and placed orders for numerous ships.

Mr. Lake deeply regretted the use to which the submarine has been placed. It was his original idea that a ship of this type would make an ideal cargo vessel, as it could be built in large dimensions, and could travel under the sea where it would be free from the dangers of storms and other hazards. However, Mr. Lake's greatest interest in the submarine was in salvage work, and he built several ships for this purpose which were used with more or less success to recover the cargo from numerous sunken vessels. At the end of Mr. Sprague's talk the questions and discussion were so prolonged that it finally had to be stopped due to the arrival of the refreshments of beer and sandwiches. The discussion, however, continued more or less informally throughout the evening, and all of us enjoyed and appreciated hearing at first hand so many facts about the submarine. We trust that at a later date Mr. Sprague can give some further details on this subject.

S. L. HENN, *Secretary*

ROCHESTER BRANCH

The regular monthly meeting of the Rochester Branch of the American Electroplaters' Society, was held Friday evening, September 17, 1943 at a new meeting place, the Rochester Chamber of Commerce.

President John Q. Adams called the meeting to order at 8:15.

In the absence of Mr. Donald C. Blum, Secretary-Treasurer, the minutes of the last meeting in May and the Board of Managers meeting held August 31; were read by President John Q. Adams.

All correspondence which accumulated during the summer, was read and approved. The Society decided to write a letter to Mr. Frank Kohlmeier, thanking him for former participation and extending him a standing invitation to attend any or all meetings in the future.

The meeting was turned over to Mr. William Tucker, educational chairman, who presented a tentative educational program for the year. The following suggestions made by the Board of Managers were voted and approved by the members:

1. The Society will buy the latest books on plating and try to make arrangements with Rundel Library to keep them there so they will be available to all members.
2. Certain members will abstract the latest scientific articles on plating and make them available to everyone in the Branch.

Mr. William Mays of the Buffalo Branch called President Adams during our meeting, concerning a joint Buffalo-Rochester picnic at Buffalo to be held Saturday, October 9.

Speaker of the evening, Mr. Myron Diggin, of Hanson-Van Winkle-Munning Co., was introduced by Mr. William Tucker. Mr. Diggin gave a very instructive and interesting talk on bright and semi-bright zinc plating comparing it with cadmium from the standpoint of

1. Solution make up and control
2. Salt spray and corrosion tests
3. Actual plating process
4. And the standpoint of appearance and its uses.

Mr. Diggin also displayed samples of bright and semi-bright and dichromated zinc plating. All members were very impressed by his very vivid descriptions and explanations. We, of the Rochester Branch, sincerely appreciated Mr. Diggins' efforts, which made our first meeting of the new year very successful.

The meeting was adjourned at 10:30.

DONALD C. BLUM, *Secretary*

HARTFORD BRANCH

The first fall meeting of the Hartford Branch was held the evening of Sept. 20, 1943 at the Hotel Garde in Hartford. The speaker of the evening was entertained by twenty-six members at a dinner given prior to the regular meeting.

President Ken Bellinger, called the meeting to order at 8:00 P.M. He con-

gratulated the members for the splendid turnout; there being 72 present including a welcome delegation from the Waterbury Branch. The Educational Committee reported that plans for the proposed Course of Study are incomplete pending a more complete return on the questionnaire sent to members. Correspondence from E. T. Candee, our Acting Secretary was noted. None of our members have yet received the Proceedings of the Buffalo Convention.

The following applications were elected to membership: Thomas Paye McFarlane, A. J. Dankevich. Applications accepted were: John T. Wieczorek, William J. Scott, Walter J. Dyber, Carmen N. Cappello, Ray H. Hathaway, Andrew W. Palm, Marjorie E. Farmer and Louis F. Galasso.

The meeting was then turned over to Henry Straw who introduced the speaker, Mr. Arthur A. Zavarella, Materials Engineer at the Springfield Armory, Mass. Mr. Zavarella who was the keynote speaker at the 5th New England Regional Convention held in Hartford last May 1st, gave a splendid two hour talk on Ordnance Finishing. This proved to be one of the best and most interesting talks given to a Hartford Branch. Five types of finishes used for small arms were detailed; Type I, Plating; Type II, Phosphate; Type III, Oxide; Type IV, Inorganic Coatings; Type V, Organic Coatings. The speaker generously evaluated each finish on the basis of factual data and personal experience. The four types of government specifications on metal finishing were outlined showing where and how each applied.

The entire talk was certainly educational and factual giving the latest developments in each type of finishing. Included were methods used in "packaging" which enabled small arms to reach the battlefields in a ready-to-use condition. At the end of the talk the assembly tendered the speaker an enthusiastic handclap. An exhibit and demonstration of several types of small arms including a Garand, Carbine, and Sub-Machine gun, also, packaging materials and photographs was enjoyed, inasmuch as these materials are now "Front Page." Just prior to conducting the above mentioned exhibit we inaugurated our "Shop Problems Session" which was ably conducted

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by Harry Sanders, our Librarian. Inasmuch as the hour was late, this "Session" was limited to one problem. This proved so lively and interesting that it should perhaps warrant a more complete presentation under separate cover. I will say briefly, however, that among others, very interesting solutions were offered by George B. Hogaboom; Harry Sanders with whom the problem originated; I. Laird Newall; Howie Donahue, our past president; Ted Wieczorek and others.

The meeting adjourned at 11:15 p.m. Sandwiches and refreshments were served during which many group discussions prevailed in a social atmosphere of congeniality.

S. ZAVARELLA, *Secy.-Treas.*

CHICAGO BRANCH

Will tin coming from the anodes in a brass solution cause any harm to the solution?

Ans. No harm will be caused by the tin.

How can an unsatisfactory Cronak deposit be removed so that it can be treated with Cronak again?

Ans. By use of a Hot Chrome Acid dip.

How can tin be plated on an assembly of high chromium steel also mild steel for a basis for soldering?

Ans. After some discussion it was thought that it was best to use the nickel chloride bath high in acid and later tin plate.

What causes cadmium plated parts .0005 to peel when given a bend test?

Ans. Several reasons can cause this such as pH to high, too much brightener, but in this case it was thought that the work was not cleaned properly before cadmium plating.

What causes excessive gassing of a cyanide copper solution, metal 2 oz. per gal. free cy., 1 oz. pH 9.8 temp. 90%.

Ans. Raise the temp. to 120 to 140% and the pH to about 12 and add some Rochelle salts.

What is the optimum pH for anodizing of aluminum parts?

Ans. .55 to 1 for the chrome acid bath.

We have had difficulty with the Parkerizing on screw threads. It adds too much to the diameter. What other finishes can be used as a substitute?

Ans. There are several black finishes on the market or try bonderizing.

What are the advantages, if any, of aluminum buss bar over copper?

Ans. The main advantage is the ease of construction, it is lighter and holes can be punched wherever needed, it takes about one-third more than copper also when used around a chrome tank it does not dissolve as quickly as copper.

What bright dip will remove heavy fire scale from beryllum copper?

Ans. Bichromate pickle as follows, water 4 to 8 gal., sulphuric acid 1 gal., sodium bichromate or chromic acid 2 to 4 oz. per gal., use at room temperature and follow with the ordinary bright dip.

What is the creamy white stone-like substance that forms on the anodes in a bright zinc solution?

Ans. In this case it was thought that the substance was most likely sodium ferrocyanide, its concentration can be lowered by cooling the solution so that it will not be detrimental, you should also find and eliminate the source of iron in the bath.

J. W. HANLON, *Secy.-Treas.*

DETROIT BRANCH

On Friday, September 10th, at the Statler Hotel, Detroit Branch commenced its fall sessions with an attendance of 86 members and visitors. Several applications for membership were read and the members then settled down to enjoy a moving picture, "The Building of a Bomber." The picture gave a good insight on how mass production methods are being applied to the Airplane industry.

The meeting was then turned over to Dr. H. L. Kellner of the Lea Manufacturing Company, who is a good speaker, and gave an enlightening talk on "Deburring with Greaseless Compounds." With the aid of a colored film he explained the method of setting up, and the use of flexible polishing wheels formed and maintained for continuous operation by frictional transfer of greaseless compounds. The use of such wheels is particularly advantageous for removing burrs from irregular contours.

After the usual question box period, Dr. Kellner treated us to the first showing of a film taken at the last convention from which we were able to recognize

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1—1000 AMPERE, 8 VOLT, **JANTZ & LEIST** Motor Generator Set. Excellent Condition.
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1—800/400 AMPERE, 6/12 VOLT, **EAGER ELECTRIC CO.** Motor Generator Set. Full Panel-Board Arrangement. Excellent Condition.
1—500 AMPERE, 30 VOLT, **WOTTEN ELECTRIC CO.** Motor Generator Set for Anodizing. Full Panel-Board Arrangement. Excellent Condition.
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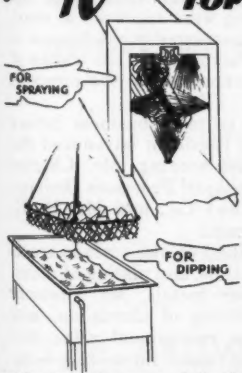

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the faces of many well-known people who were attending the educational sessions and the social functions. The meeting closed with a resume of the technical papers of the Convention by Mr. Sampson.

Our next meeting is Friday, October 1st. We are looking forward to hearing Mr. R. A. Shaefer present his paper on "Rapid Silver Plating" and to seeing the movie "This Plastic Age."

F. L. CLIFTON, *Secy.-Treas.*

PITTSBURGH BRANCH

The Pittsburgh Branch held its first Fall meeting Thursday, September 2nd, at the Fort Pitt Hotel at 8:00 P.M. The meeting was preceded by a dinner at 6:30 P.M. to which twenty-three were present.

During the business session presided over by President H. F. Saylor, a motion was passed that beginning November 11, 1943, the regular meetings will be held the second Thursday of each month at the Fort Pitt Hotel. The October meeting will be held the first Thursday, October 7th, due to the convention of the American Electrochemical Society in New York.

Following the business meeting, Mr. Schweikher of the E. I. du Pont Co. presented a paper on Lead Plating. The paper was followed by plating several samples in a Hull Cell, which proved very interesting. A spirited discussion followed and a great deal of interest was shown. Following Mr. Schweikher's display a film on first aid was shown. The picture was timely and enjoyed by all.

FRANK R. KELLER, *Secretary*

NEWARK BRANCH

The regular meeting of the Newark Branch A.E.S. was held on Friday, July 16th, 1943, at the Hotel Robert Treat, Newark, New Jersey. The meeting was called to order at 8:30 P.M. by President William Bruhns. All other officers were present.

The minutes of the previous meeting were read and approved. A bill for the Per Capita Tax for the first quarter of 1943, in the amount of 125.55 was voted to be paid.

An application of Clifford Struyk of the Wright Aeronautical Corporation to Associate Membership and an application of Norman E. Brewerton of the Tycoon Tackle Corporation to Active Membership were voted to take the regular course.

Mr. Horace Smith and Mr. Paul Oldham reported that a Past Presidents Society of the Newark Branch was being organized. This report caused quite some discussion and after considerable debate a vote was taken with the results that 98% of the members present were in favor of the formation of this Organization for the purpose of handling the social activities and directing the welfare of the Branch. Mr. Smith was appointed Chiarman of this body until an election of officers will be effected.

Our Librarian, Mr. Edward Washburn, gave a demonstration of depositing silver on aluminum. The process was recorded by Mr. Louis Donroe and will subsequently be forwarded to THE MONTHLY REVIEW for publication.

The meeting was adjourned at 11:00 P.M., after which refreshments were served.

GEORGE WAGNER, *Secretary*

TOLEDO BRANCH

Regular meeting of the Toledo branch was held at the Hilcrest Hotel in Toledo, Ohio, on June the 3d, 8:00 P.M.

The meeting was presided over by President Paul Dressel. Minutes of the previous meeting were approved as read. The secretary instructed the delegates to the convention according to the wishes of the branch as expressed in the previous meeting.

There being no more business before the meeting the President introduced the speakers for the evening, Mr. Charles Cohn of the Technical Processes Division of Colonial Alloys Co., and Mr. H. G. Erstrom of Chicago.

Mr. Cohn talked on the surface treatment of light metals, and plating of aluminum, and other metals. Mr. Erstrom talked on anodizing of aluminum, and magnesium. For educational value this was one of the most interesting educational sessions of the year. These gentlemen not only gave a very good talk on a very interesting subject, but they actually backed up their talk with results right before our eyes, by plating and anodizing small articles as well as color-

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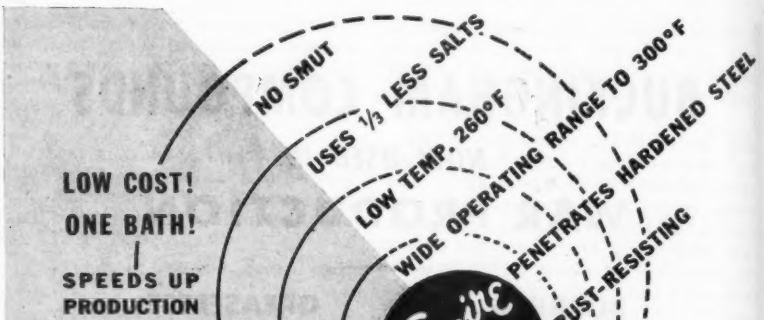

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ing and sealing operations, in their solutions and equipment set up on a long table before the meeting started. Samples of aluminum were cleaned rinsed copper plated in cyanide and acid copper solutions and nickel plated, by using a preplate solution, after it is nickel plated it can then of course be plated with any desirable metal plate, pieces were also anodized during the meeting, colored, which are then sealed in dichromate solutions. They also gave a very good demonstration by soldering two pieces of aluminum together by merely putting on some special solder and heating the pieces till this solder would smoke which is the sign that the process is complete. The pieces could not be broken apart where they were joined together, that is, at least not with a pair of pliers.

The Toledo branch extends hearty thanks to both Mr. Cohn, and Mr. Erstrom for a very pleasant and interesting evening, and to the Technical Processes Division of Colonial Alloys Co. for having made it possible to have two such capable gentlemen speak before our branch meeting.

The meeting adjourned at 11 P.M.

G. H. BERGEMAN, *Secretary*

TORONTO BRANCH

The first regular fall meeting was held on September 10th at tht Royal York Hotel.

Allen Byers in the chair welcomed three visitors and the rest of the members numbering 43, introduced Mr. James Vaughan as speaker of the evening and said most of the members wondered why current does not go around corners and that Mr. Vaughan would explain why and all about it. Secretary Creighton read two letters from Mr. Candee and Mr. Helmle. Two applications for membership were received and the application of Mr. James Biden was ballotted on and elected into membership. Regrets were expressed at the death of Mr. W. Salmon in Montreal who was a member of Toronto Branch for many years and as Mr. John Acheson reported that Bill Salmon was our first secretary.

At this point President Boaz suddenly appeared and started to talk of the Branch's annual activities such as the annual card and dance party to be held sometime in March; Tom is a live wire and in no time at all had the committees lined up so as to secure the Hall early.

Under Good and Welfare, Mr. James Vaughan was called; his subject being "Racking and Current Distribution in Hard Chrome Plating." Mr. Vaughan started by saying—to do good work in this phase of plating everything had to be to perfection; that it was quite true that all the Sol in the bath was a conductor and that he wished to create an interest by saying if the plater knew his current distribution and working with 33 ounces to the gallon at a temperature of 131 the results would be good work. Mr. Vaughan explained the flow of current by drawing on large sheets of paper hung over the blackboard, this was one of the most interesting talks ever heard at any Toronto Branch meeting. In materials, he had plenty, such as plating racks with the pieces plated in them. He talked on insulation and showed dummies bolted on racks with mica gaskets, showing samples of his work in almost every shape from gages to reamers, showing gun barrel with small bore about 2 feet long and chrome plated clean through, explaining everything in detail, truly a talk well worth while and an evening well spent; as a member of Toronto Branch. Toronto members are proud of this young plater who has every prospect of greater things, thanks to you, Jimmie Vaughan.

Meeting adjourned 10:30.

JAMES S. CAIRNS

CLEVELAND BRANCH

Minutes of the meeting of the Cleveland Branch of the American Electroplaters' Society held in the Cleveland Hotel on Saturday evening, August 7, 1943.

The meeting was called to order at 8:30 P.M. by our President, Mr. William E. O'Berg.

The minutes of the June 5th meeting were read and approved as was also the financial statement for August 7, 1943.

The applications of: Mr. Richard T. Stafford of Wickliffe, Ohio, as Active; Mr. Royal F. Strickland of E. Cleveland, Ohio, as Associate; Mr. John T. McQuillin of Lakewood, Ohio, as Associate; Mr. George E. Gamble of Cleveland, Ohio, as Associate; were read and referred to the Board of Managers.

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Mr. Joseph F. Kramer of Cleveland, Ohio, whose application was read at the May meeting was elected to Active membership.

A report on the Annual Outing held on July 17 was given by Mr. S. F. Miller. This affair was a very successful one. There was some discussion as to the feasability of eliminating the admission charge on future affairs.

The delegates to the Annual Convention, Messrs. Scott and O'Berg, gave very interesting reports which seemed to indicate beyond a doubt that this convention was a most outstanding one, both as to papers presented and social events. These were received with a vote of thanks and the delegates discharged.

Quite a bit of discussion was then had in reference to the 1944 Convention. The request of the Fred B. Gumm Co. to care for the Victory Lunch was granted and permission was given to the Hanson-Van Winkle-Munning Company to publish the Convention News as in the past—both with a vote of thanks.

It then was agreed that the next regular meeting be held on Saturday, September 11, instead of the 4th so as not to interfere with the holiday activities.

There being no further business, the meeting adjourned at 10:30 P.M.

GEORGE B. SVENSON, *Sec.-Treas.*

LANCASTER BRANCH

The Lancaster Branch of the A.E.S. met Friday evening Sept. 10th at 8 o'clock at Stevens Trade School. The meeting was called to order by the President, Mr. H. L. Hovis. The program chairman outlined the program for the year and as soon as it is complete a special notice listing all the meetings will be prepared.

The speaker for October will be Mr. MacIntyre who will speak on the Hull Cell.

Mr. Hovis introduced the speaker, Mr. D. W. Prichard, of tht Quaker Chemical Co., who spoke to us on "New Cleaners and Cleaning Procedures."

Mr. Prichard briefly outlined the development of cleaning from the use of benzine and gasoline with caustic soda or potash followed by the variation of the caustic content. This was later followed by the advent of the silicates and phosphates.

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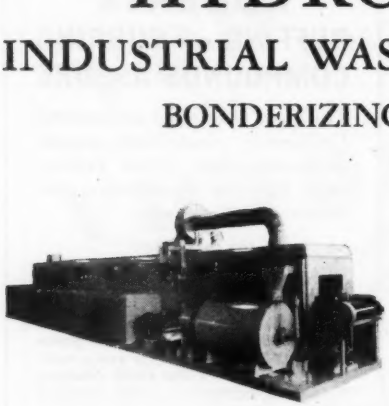

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Mr. Prichard then reviewed the various cleaning methods used and the relative merits of each.

After outlining the typical composition of the average type of cleaners, Mr. Prichard threw the meeting open for questions. After a brief discussion the meeting was adjourned at 10 o'clock.

WILLIAM H. FORDNEY, *Secy.-Treas.*

CLEVELAND BRANCH

Minutes of the meeting of the Cleveland Branch of the American Electroplaters' Society held in the Cleveland Hotel on Saturday evening, Sept. 11.

The meeting was called to order at 8:30 P.M. by our President, Mr. William E. O'Berg.

The minutes of the August 7 meeting were read and approved as was also the Treasurer's report.

Under the elections of members the following candidates whose names were read at the June 5 meeting and which were published in the August issue of *The Monthly Review* were elected to membership: Mr. Cliff L. Rickett of Meadville, Pa., as Associate; Mr. Ruel K. Shumway of Cleveland, Ohio, as Active.

A discussion was had as to the best time to hold the Annual Dinner Dance and it was finally decided that it be held as near to Washington's Birthday as possible.

The speaker of the evening, Mr. Sizelove from the Frederick B. Gumm Chemical Company was then introduced by our Librarian, Mr. John Honnecker. Mr. Sizelove gave a very interesting talk on Burring which was enjoyed by all.

There being no further business, the meeting adjourned at 10:30 P.M.

GEORGE B. SVENSON, *Secy.-Treas.*

CHICAGO BRANCH

The regular monthly meeting of Chicago Branch was held Friday, Sept. 10, 1943 at the Atlantic Hotel.

President R. J. Hazucha presiding and all other officers present.

A motion was made and seconded that

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Mr. H. A. Gilbertson was reported as very ill, also Mr. J. Manderscheid. Chicago Branch extend their best wishes for a speedy recovery to both these fine gentlemen.

Mr. Krentel introduced the guest speaker of the evening, Mr. A. J. Smith, Jr., of the Dow Chemical Co., who made a very interesting and instructive talk on "Finishing of Magnesium and Its Alloys," this talk was followed by the sound picture "Handling of Magnesium," both the talk and the picture brought out some very valuable information regarding this metal.

There were 65 in attendance at this meeting which adjourned at 10:30 P.M.

J. W. HANLON, *Secretary*

CINCINNATI BRANCH

The regular meeting of the Cincinnati Branch, A.E.S., was held on Thursday evening, May 27, 1943, at the Hotel Gibson, Cincinnati, Ohio. The meeting was called to order by President Harry Misner at 8:00 P.M. All other officers were present.

The minutes of the previous meeting were read and approved. There were no communications and the bills which were presented were approved and ordered paid.

Mr. J. C. Lockerbie's transfer from the Chicago Branch was read and was welcomed as a member of the Cincinnati Branch.

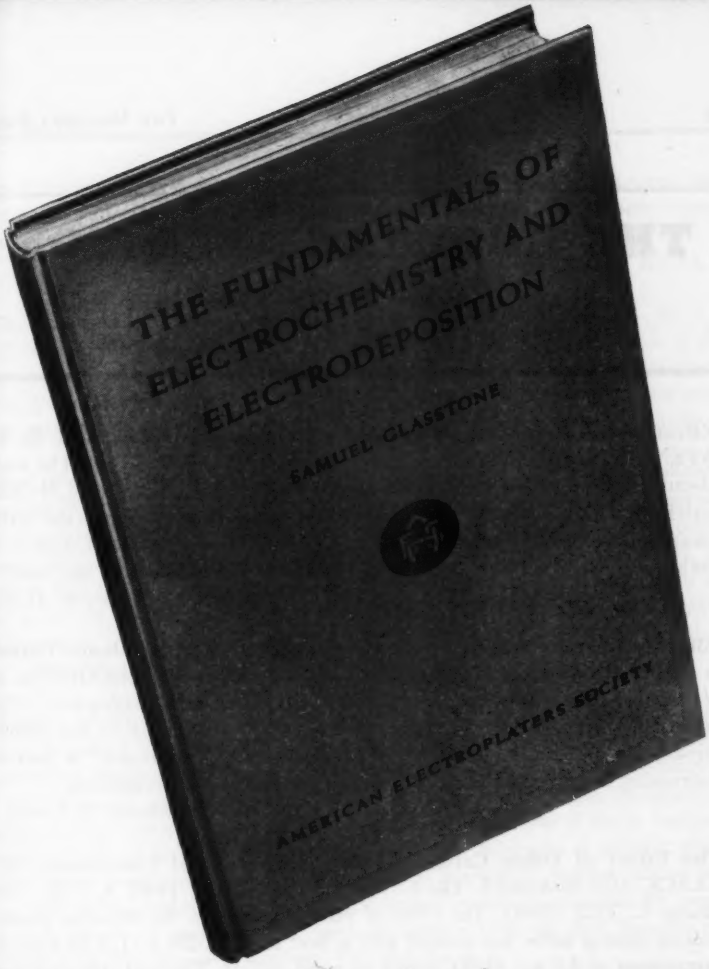
Mr. Robert Knoepfler distinguished himself by winning the first prize, which was a silvtr cup, for his work in the 1942-1943 membership drive. Alcide Foreman took second prize for his splendid work.

The next order of business was election of officers, at which the following were elected for the coming year: William B. Stoddard, Jr., president; William J. Ehlen, vice-president; Elliott W. Horning, secretary-treasurer; Eric Wishhausen, librarian.

Board of Managers: Harry Misner, Robert Knoepfler, Ross Newton, H. C. Luechauer and Alcide Foreman.

There being no further business, the meeting was adjourned with refreshments being served in the room.

ELLIOTT W. HORNING, *Secy-Treas.*



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THE ABSTRACT SECTION

MAURICE R. CALDWELL

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Effect of Drawing on the Properties of Chromium-plated Steel. By E. S. TOVPENETS. *Stal* **11,** No. 4, 77 (1941); *Chem. Zentr.* **1942, 1,** 674. The surface of electrolytically Cr-plated steel containing C 0.33, Cr 0.79, Ni 2.94 and Mo 0.32% is enriched with H, resulting in a decreased ductility of the steel near the surface. By drawing the steel at 500° (932° F.) and H is removed and the ductility is considerably increased, without appreciably decreasing the hardness of the steel.

H. W. RATHMANN, *Chemical Abstracts*

Effect of Current Density on the Crystal Structure and Cathodic Polarization in the Production of Electrolytic Nickel. By S. P. MAKAR'EVA. *Bull acad. sci. U.S.S.R., Classe sci. chim.* **1941,** 573-80 (English summary); *Chem. Abstracts* **37,** 2272 (1943). The effect of c.d. on the orientation of the grains in electrodeposited nickel is described. The reflectivity or "brightness" is increased by increasing the orientation and decreasing the size of the crystallites.

ERNEST H. LYONS, JR.

The Effect of Other Cations on the Deposition of Chromium. By A. POLLACK. *Oberflächentech.* **18,** 4 (1941); *Chem. Zentr.* **1941 1,** 1732; *Chem. Abstracts* 37, 2272 (1943). The effect of various metals on the throwing power of chromium plating baths was studied with a bent cathode, 350 g./1. CrO_3 bath with the equivalent of 3.5 g./. H_2SO_4 added as metal sulfate. The best throwing power was obtained with $WgSO_4$. The next best, in order, were: Cd, trivalent Cr, Fe, H_2SO_4, Cu, and Na was worse.

ERNEST H. LYONS, JR.

Some Factors Affecting Automatic pH Control. By W. N. GREER and A. L. CHAPLIN. *Trans. Electrochem Soc.* **83,** (Preprint) 1943. For good automatic pH control, there must be thorough agitation so that the acid is evenly distributed and the pH is uniform through the tank. In addition, the flow through the tank should be comparatively large in comparison with the volume of the tank. These considerations are developed mathematically and related to the buffer index and time lag before the automatic control responds to a change in pH. From the equations given the application of control equipment to a plating tank may be calculated.

ERNEST H. LYONS, JR.

The Flexibility of the Cuprous Oxide Rectifier for Automatic Control Equipment in Electroplating. By G. E. HUENERFAUTH. *Trans. Electrochem. Soc.* **83,** (Preprint) 1943. The advantages of a power-supply consisting of a number

of small units, such as certain 500 amp. rectifiers, are illustrated by diagrams showing a number of alternate arrangements, and the application of automatic controls to them as for nickel and chromium plating and especially for anodizing.

ERNEST H. LYONS, JR.

Thermodynamic Considerations in the Corrosion of Metals. By J. C. WARNER. *Trans. Electrochem. Soc.* **83,** (Preprint) 1943. The application of thermodynamics to corrosion reactions is discussed, with the aid of a table of electromotive forces and free energy changes for the corrosion of thirteen common metals by air and water. ERNEST H. LYONS, JR.

New Can Order Poses Difficulties. *Electrolytic Plate Ruled Mandatory.* Amended M-81 Order is expected to cause many headaches for can manufacturers. Tin plate producers only difficulty is one of supplying enough plate soon enough. Tests conducted on new specified .75 Lb. coatings are said to be satisfactory, compared to 1.25 Lb. coatings of hot-dipped tin plate. Checkup on electrolytic tin plate lines shows 18 operating, 2 on dull finish, and a total of 11 different companies. By November, an additional 10 new lines will be in operation.—IRON AGE, Vol. 152, No. 5, Page 84, 1943.

Future of Tin Plate. Quick freezing and dehydration of foods may become factors to reduce the amount of tin plate used for cans. However, new techniques in operation of electrolytic tin plate make it doubtful whether hot-dip coatings will be used for any appreciable number of foods. The advantages of electrolytic tinning present a bright future for the continuance of the use of tin in containers, because of ease of handling in large coils, control of thickness of coating, and the ability to use bright cold rolled steel in place of hot rolled. Savings in cost of tin plate and its successful combination with organic coatings over thin tin deposits make containers of such material more acceptable than the less durable types. —IRON AGE, *Tin Research Institute,* Vol. 152, No. 5.

Processing Layouts for Metal Cleaning. Metal cleaning should be considered in relation to the prior and succeeding operations. From the facts developed by such an analysis, it is possible to provide a cleaning method and material that will satisfy the particular conditions required. Cleaning problems fall into three general classifications:

(1) Cleaning after one operation as a preliminary to a subsequent operation.

(2) Cleaning before the application of a protective or decorative coating.

(3) Cleaning as a final operation prior to assembly or inspection.

Flow sheets, showing operations involved in "Cleaning for Hardening and Drawing", "Cleaning of Iron, Copper and Aluminum Alloys for Annealing and Further Draw", "Cleaning of Steel for Selective Carburizing and Cyaniding".—AMERICAN MACHINIST, *C. W. Smith,* Vol. 87, No. 15, Pp. 102-104, 1943.

BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

Electroplating: A Survey of Modern Practice, Including the Analysis of Solutions. SAMUEL FIELD and S. DUDLEY WEILL. Fourth Edition, 437 pages. Pitman Publishing Corporation, New York, New York, 1943. Price, $5.00.

The new fourth edition of Field and Weill is 56 pages longer than the third edition of 1938, but smaller and thinner due to its production in wartime England and the use of poorer and thinner paper. Numerous minor additions have been made throughout most of the text, the major additions being a new chapter on the testing of electrodeposits. Some of the other subjects under which new matter was noticed were: electrode potentials and overvoltage, filtration, full automatic plating, stripping of various electrodeposits, analysis of solutions (throughout, but especially for bright nickel baths), and specifications for deposits. Much of the new material added is taken from the literature.

The chapter headings are as follows: Fundamental Principles, Electrolysis, Faraday's Laws, Principles of Chemical Analysis of Electrodepositing Solutions, Some Materials Used in Electroplating, Sources of Current, Properties of Electrodepositing Solutions, Electroplating Plant, Mechanical Cleaning, Chemical Cleaning, Deposition of Copper – The Acid Bath – Alkaline Baths, Silver, Gold, Nickel (2 chapters), Zinc, Cadmium, Chromium, Various Metals, Deposition of Alloys, Testing of Electrodeposits, Allied Processes, and Metal Colouring.

This is an excellent and dependable textbook of electroplating, but of course applies primarily to English practice. While both England and the United States are english speaking countries, differences of usage are sometimes surprising. Thus a section on page 412 on "Parcel Deposition" was puzzling to the reviewer until a careful reading revealed that it seemed to relate to the plating of part of an object while

the remainder was insulated or stopped off. The term "stop-off" does not seem to be used in the book and one misses it, although curiously enough, the subject of "Parcel Deposition" is also indexed under "Stopping Off."

Some errors in references and in the spelling of author's names were noted, and these should be corrected in future editions. An outstanding feature of the book is the detailed presentation of methods of analysis for controlling various baths, and these should be helpful to some workers.

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(1) **Standard Handbook for Electrical Engineers.** Edited by A. E. KNOWLTON and R. M. SHOOK. 2303 pages, $8.00.

(2) **Cleaning and Finishing Metal Products.** Published by Iron Age. 235 pages, $3.00.

(3) **Modern Metallurgy for Engineers.** By Frank T. Sisco. 432 pages, $4.50.

(4) **An Introduction to Electrochemistry.** By SAMUEL GLASSTONE. 553 pages, $5.00

(5) **The Fundamentals of Electrochemistry and Electrodeposition.** By SAMUEL GLASSTONE. 90 pages, $2.00.

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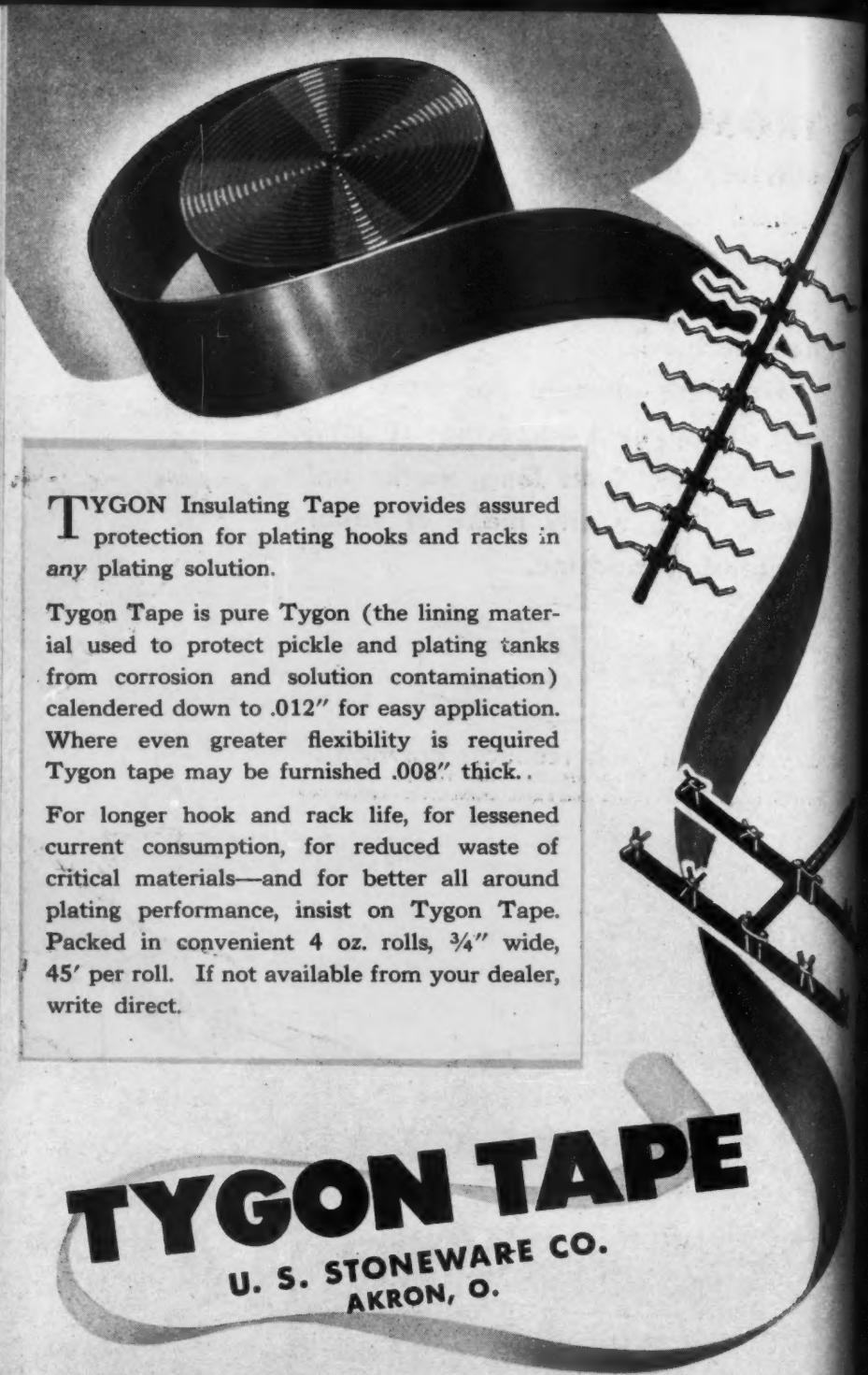

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